

CLAIMS

What is claimed:

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1 A method for cell replication comprising:

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receiving a request for data transmission through a crossbar and a

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corresponding mapping information, the mapping information received by

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the crossbar and received from one of a plurality of software configurable slot

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remap registers, the mapping information indicative of a destination slot and

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a backup destination slot to which the data is to be transmitted; and

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replicating the data by transmitting the data to the destination slot and

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to the backup destination slot when the data arrives at an input slot of the

9

crossbar.

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2. The method of claim 1 further comprising determining whether

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the destination slot and the backup destination slot to grant the request are

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available, the availability determined by a scheduler.

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3. The method of claim 2 further comprising transmitting a control

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signal to the crossbar once availability is confirmed, the control signal

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transmitted by the scheduler and indicative of the availability of the

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destination slot and the backup destination slot.

1 4. The method of claim 3 further comprising sending an
2 acknowledgment back to a source of the request.

1 ~~5.~~ An apparatus for cell replication comprising:
2 a crossbar to direct data traffic; and
3 a scheduler coupled to the crossbar, the scheduler comprising a
4 plurality of signal inputs and a plurality of signal outputs and configured to
5 provide control signals to the crossbar, the plurality of signal inputs being
6 requests for data transmission through the crossbar, and the plurality of signal
7 outputs being grants to the requests, data for which a request for transmission
8 is granted by the scheduler is replicated and processed through the crossbar to
9 a destination slot and to a backup destination slot according to software
10 configurable mapping information.

1 6. The apparatus of claim 5 wherein the crossbar is further
2 comprised of a plurality of data in signals and a plurality of data out signals
3 and is a spatial crossbar.

1 7. The apparatus of claim 6 further comprising a plurality of slot
2 remap registers coupled to the crossbar and the scheduler, the plurality of slot
3 remap registers being software configurable and configured to provide the
4 mapping information to the crossbar and the scheduler, the mapping

5 information identifies the data out destination slots of the crossbar to which
6 data is to be transmitted through the crossbar.

1 8. The apparatus of claim 7 wherein each the plurality of slot
2 remap registers corresponds with one of the plurality of data in signals of the
3 crossbar.

1 9. The apparatus of claim 8 wherein each the plurality of slot
2 remap registers corresponds with a sequential one of the plurality of data in
3 signals of the crossbar.

1 10. The apparatus of claim 8 wherein the scheduler receives
2 mapping information indicative of the destination slot and the backup
3 destination slot from the slot remap register when a request comes in to one
4 of the plurality of input slots.

1 11. The apparatus of claim 10 wherein the scheduler determines
2 whether the destination slot and the backup destination slot as identified by
3 the mapping information for the specific input slot are available.

1 12. The apparatus of claim 11 wherein the scheduler transmits a
2 control signal to the crossbar which indicates that data in slot is permitted to

3 send a cell to its intended the destination slot and the backup destination slot
4 once the availability is confirmed.

1 13. The apparatus of claim 12 wherein the scheduler sends an
2 acknowledgment back to a source of the request.

SUB A'
1 14. A network switch system comprising:
2 a plurality of processor cards comprising a central processing unit and
3 high level software;
4 a plurality of switch cards coupled to the plurality of processor cards
5 and implemented with a cell replication feature, the plurality of switch cards
6 comprises of a plurality of switch planes; and
7 a plurality of line cards coupled to the plurality of switch cards, the
8 plurality of line cards to interface the plurality of switch cards with traffic
9 coming in and out of a plurality of physical ports.

SUB B'
1 15. The system of claim 14 wherein the cell replication feature
2 further comprises:
3 a crossbar to direct data traffic; and
4 a scheduler coupled to the crossbar, the scheduler comprising a
5 plurality of signal inputs and a plurality of signal outputs and configured to
6 provide control signals to the crossbar, the plurality of signal inputs being
7 requests for data transmission through the crossbar, and the plurality of signal
8 outputs being grants to the requests, data for which a request for transmission

9 is granted by the scheduler is replicated and processed through the crossbar to
10 a destination slot and to a backup destination slot according to software
11 configurable mapping information.

1 16. The system of claim 15 wherein the crossbar is further comprised
2 of a plurality of data in signals and a plurality of data out signals and is a
3 spatial crossbar.

1 17. The system of claim 16 further comprising a plurality of slot
2 remap registers coupled to the crossbar and the scheduler, the plurality of slot
3 remap registers being software configurable and configured to provide the
4 crossbar and the scheduler the mapping information which identifies the data
5 out destination slots of the crossbar to which data is to be transmitted through
6 the crossbar.

1 18. The system of claim 17 wherein each the plurality of slot remap
2 registers corresponds with one of the plurality of data in signals of the
3 crossbar.

1 19. The system of claim 18 wherein each the plurality of slot remap
2 registers corresponds with a sequential one of the plurality of data in signals
3 of the crossbar.

1 20. The system of claim 19 wherein the scheduler receives mapping
2 information indicative of the destination slot and the backup destination slot
3 from the slot remap register when a request comes in to one of the plurality
4 of input slots.

1 21. The system of claim 20 wherein the scheduler determines
2 whether the destination slot and the backup destination slot as identified by
3 the mapping information for the specific input slot are available.

1 22. The system of claim 21 wherein the scheduler transmits a
2 control signal to the crossbar which indicates that data in slot is permitted to
3 send a cell to its intended the destination slot and the backup destination slot
4 once the availability is confirmed.

1 23. The system of claim 22 wherein the scheduler sends an
2 acknowledgment back to a source of the request.

SUB A²

1 24. An apparatus for cell replication comprising:
2 mean for directing data traffic; and
3 means for controlling the means for directing, the means for
4 controlling coupled to the means for directing comprising a plurality of signal
5 inputs and a plurality of signal outputs and configured to provide control

6 signals to the means for directing, the plurality of signal inputs being requests
7 for data transmission through the means for directing, and the plurality of
8 signal outputs being grants to the requests, data for which a request for
9 transmission is granted by the means for controlling is replicated and
10 processed through the means for directing to a destination slot and to a
11 backup destination slot according to software configurable mapping
12 information.

SUPP
1 25. The apparatus of claim 24 wherein the means for directing is
2 further comprised of a plurality of data in signals and a plurality of data out
3 signals and is a spatial crossbar.

1 26. The apparatus of claim 25 further comprising a plurality of
2 means for storing coupled to the means for directing and the means for
3 controlling, the plurality of means for storing being software configurable and
4 configured to provide the mapping information to the means for directing
5 and the means for controlling, the mapping information identifies the data
6 out destination slots of the means for directing to which data is to be
7 transmitted through the means for directing.

1 27. The apparatus of claim 26 wherein each the plurality means for
2 storing corresponds with one of the plurality of data in signals of the means
3 for directing.

1 28. The apparatus of claim 27 wherein each the plurality means for
2 storing corresponds with a sequential one of the plurality of data in signals of
3 the means for directing.

1 29. The apparatus of claim 28 wherein the means for controlling
2 receives mapping information indicative of the destination slot and the
3 backup destination slot from the means for storing when a request comes in
4 to one of the plurality of input slots.

1 30. The apparatus of claim 29 wherein the means for controlling
2 determines whether the destination slot and the backup destination slot as
3 identified by the mapping information for the specific input slot are available.

1 31. The apparatus of claim 30 wherein the means for controlling
2 transmits a control signal to the means for directing which indicates that data
3 in slot is permitted to send a cell to its intended the destination slot and the
4 backup destination slot once the availability is confirmed.

1 32. The apparatus of claim 31 wherein the means for controlling
2 sends an acknowledgment back to a source of the request.

Add #3